

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

**ANNE BRUMBAUGH, ET AL.,
Plaintiffs,**

vs.

**WAVE SYSTEMS CORPORATION, ET
AL.,
Defendants.**

Civil Action NO. 04-30022-MAP

AFFIDAVIT OF CHRISTOPHER M. JAMES

I. Introduction

1. I am the William H. Dial/SunBank Eminent Scholar and Professor of Finance at the University of Florida. Prior to joining the faculty of the University of Florida, I taught courses in finance including investments, corporate finance and financial markets at the University of Oregon and the University of Michigan. I have also held positions at the Federal Reserve Bank of San Francisco, the Federal Deposit Insurance Corporation and the Treasury Department. Over the past ten years, I have served as a consultant on matters concerning security pricing, corporate financial policy, mergers and acquisitions and corporate strategy. I am currently the independent distribution consultant, as approved by the SEC, for the Janus funds market timing matter. My academic research has been in the area of

- security pricing, bank management, corporate finance and financial institutions. I have published numerous articles on the relationship between securities prices and financial and accounting information. I currently serve on the Advisory Board of SunTrust Bank. I also serve on the editorial boards of four scholarly journals including the *Journal of Financial Economics*. I served as an associate editor of the *Journal of Finance* and as editor of the *Journal of Financial Intermediation* from 1988 through 1999. I also served on the academic advisory board of the Turnaround Management Association from 1992 to 2002. A copy of my curriculum vitae is attached as Exhibit 1.
2. I have been retained by counsel for Wave Systems Corporation in the matter of Anne Brumbaugh, et al., (“Plaintiffs”) vs. Wave Systems Corporation, et al., (“Wave” or “Defendants”). I have been asked to evaluate the reasonableness of Plaintiffs’ motion for class certification. In preparing this report, I relied upon my experience and prior research, documents produced in this litigation, and additional materials. A complete list of materials I reviewed is included in Exhibit 2. I am being compensated at my usual hourly rate of \$650. Cornerstone Research, working under my direction, assisted me in my work.

II. Background to Plaintiffs’ Allegations

3. Wave is a development stage company that “develops, produces and markets products for hardware-based digital security, including security applications and services that are complementary to and work with the specifications of the

- Trusted Computing Group [“TCG”]....”^{1, 2} Wave’s operations to date have consisted primarily of product development, performance under contract to develop products and preliminary marketing to personal computer and Semiconductor Chip original equipment manufacturers, resellers, and enterprises.
4. Plaintiffs allege that Defendants issued materially false and misleading statements that misled the investing public concerning, among other things, Wave’s characterization of its relationships with Intel and IBM and the likelihood that these relationships would produce significant revenue.³ Plaintiffs’ Class Certification Memo describes a class “consisting of all persons or entities who purchased the common stock of Wave...on the open market during the period from July 31, 2003 through December 18, 2003 inclusive,” (the “Class Period.”)⁴
 5. On July 31, 2003, Wave announced an agreement with Intel that would “enable Intel to bundle Wave’s software and services with a future Intel desktop motherboard, targeted for trusted computing platforms.” The Company’s press release included a quote from an Intel spokesperson: “Wave helps fill a critical requirement for trusted computing services....We believe the...software will provide good value for our customers looking for trusted computing

¹ Wave Systems Corporation Form 10-K filed as of 3/16/06.

² The TCG is an industry standards body, composed of computer and device manufacturers, software vendors and others. Founding companies include HP, Intel, IBM and Microsoft. The group’s purpose is to develop, define and promote open industry standard specifications for embedded hardware-enabled computing products, including security technologies across multiple platforms, peripherals and devices.

³ Plaintiffs’ Memorandum of Law in Support of Motion for Class Certification (“Class Certification Memo”), page 13.

⁴ *Ibid*, page 1. According to the Class Certification Memo, the class excludes “defendants, immediate families, any subsidiary, affiliate, or control person of any such person or entity, the officers of Wave and the legal representatives, heirs, successors or assigns of any such excluded party.”

applications.” Wave Systems’ stock closed up \$1.41 or 167.9% on July 31, 2003 and another \$1.40 (62.2%) on August 1, 2003.

6. On August 4, 2003, prior to the market open, Wave announced that its new software security applications were compatible with the security hardware and software on IBM’s ThinkPad notebooks and ThinkCentre desktops. Wave noted that “[t]he compatibility of Wave’s security software applications with IBM’s hardware and software security solution is a result of Wave’s successful participation in IBM’s Independent Software Vendor program. This partnership is another example of IBM’s commitment to help independent software vendors use IBM’s hardware and software-based security system to make computing as secure as possible for the end-user.” Wave’s stock continued to climb, closing up 21.1% on volume of 46.1 million shares by the end of the day.
7. On December 18, 2003, after market close, Wave issued a press release stating that the SEC had begun a formal investigation of the Company. According to Plaintiffs’ Consolidated Amended Class Action Complaint filed on October 22, 2004 (the “Amended Complaint”), the press release stated in relevant part:

...[T]he Securities and Exchange Commission has commenced a formal investigation into certain matters relating to Wave. The SEC’s investigative order, received by Wave on December 17, 2003, relates to certain public statements made by Wave during and around August 2003, as well as certain trading in Wave’s securities during such time.

The following day the Company’s stock price closed at \$1.50, down 17.1% (\$0.31) from the prior day’s closing price.

8. Wave's common stock trades on the Nasdaq National Market under the symbol WAVX. For the year prior to the start of the Class Period, average weekly trading volume for WAVX was less than one million shares, approximately 1.6% of shares outstanding.
9. According to Bloomberg there were fewer than 30 market makers reporting trading activity for WAVX prior to the start of the Class Period; during the Class Period that number swelled to over 100.⁵ I was unable to identify any analyst coverage of WAVX at any time prior to or during the Class Period.⁶

III. The identified class period includes investors who purchased after corrective disclosures.

10. Plaintiffs allege that Wave's stock price was inflated because the Company issued false and misleading information regarding its relationships with Intel and IBM in July and August 2003. In their Amended Complaint, Plaintiffs identify the December 18, 2003 announcement of a formal investigation by the SEC as the only corrective disclosure and conclude that this date is the appropriate end to the alleged class period. However, it is clear from my review of the announcements by Wave that market participants were aware of the relevant information in this matter well before December 18, 2003. In particular, Wave clarified the nature of its relationships with IBM and Intel to the public by no later than August 14, 2003.

⁵ Based on Bloomberg "MKAC" screens.

⁶ Based on a search of widely used sources of analyst reports and analyst coverage such as Bloomberg, Investext, Multex and Nelson's Directory of Investment Research.

11. On August 14, 2003, after the market's close, Wave's President and CEO, Stephen Sprague, and CFO, Gerard Feeney, held a conference call to discuss Wave's second quarter 2003 results.⁷ During the call, the Company answered a number of questions from market professionals on the terms and structure of the Intel relationship. For example, in response to a question related to expected revenue, Mr. Sprague answered:

...Intel hasn't been specific about what their volumes are in the market and I'll let Intel answer ultimately that volume question. We receive a fee on a per motherboard basis. There are no minimums in the contract and there are no maximums in the contract. They decide what products they put it on and how many products they put it on.... So it's just premature to answer the question....

And, in response to a question related to the exclusivity of the Intel relationship,

Mr. Sprague answered:

No, it's not an exclusive with Intel. We are a supplier to them. It's a very standard PC OEM industry contract. We built something they think is currently cool, they can replace it when they decide they want to replace it with something else. They can use it as broadly as they want, or as little as they want.

12. I have seen no evidence that the relationship with Intel and the potential for revenues were misconstrued or misunderstood by the market. In fact, the press release, the reporting in the public press that followed the press release, as well as postings on Internet message boards in early August by investors following Wave Systems, all cited that the financial terms of the Intel relationship were not disclosed.

⁷ See entire transcript of the August 14, 2003 conference call attached as Exhibit 6 to Appendix of Exhibits to Defendants' Memorandum of Law In Opposition To Plaintiffs' Motion For Class Certification.

13. The August 14, 2003 conference call also included questions from investors concerning the IBM relationship and what it would mean for Wave's revenues.

According to Stephen Sprague:

...IBM shipped multiple millions of units of TPM platforms in the market, and what we've done is we have certified our technology in a manner that it works against their independent software program, and we're now engaged with them to develop those programs with them to reach out and offer this type of application base to their customers, which (multiple speakers) do independently and we can do jointly with them.

And, in response to a follow-up question comparing the IBM and Intel relationships, Mr. Sprague answered:

In some ways it's very different. Intel is a customer who has purchased a license to certain software that they have the right to bundle, and they can decide what platforms it goes on and what specific services they want to bundle or not bundle. In the case of IBM, it's an Independent Software Vendor program where what we have done is certify. They've taken our software, tested it, said yes, this does what it says it does. It uses a TPM properly. It works with the IBM platform. So we can then go offer it as an improved *[sic]* supplier to IBM to customers who've purchased TPM platforms, both IBM platforms, although ultimately this will work on any of the TPM platforms.

14. Given the explanations offered by the Company during the second quarter earnings conference call, it is evident that by August 14, 2003 market participants were aware of all relevant information composing the basis of the Plaintiffs' allegations. Indeed, the announcement on December 18, 2003 did not include any new information regarding Wave's relationships with Intel and IBM. Likewise, the public had been fully informed about insider transactions by August 11,

2003.⁸ Therefore, Plaintiffs' alleged class period includes investors who purchased their shares long after any corrective disclosure.

15. Notably, the information released in the conference call did not affect Wave's stock price. Using the standard event study methodology, I analyzed whether the price change on August 15th was statistically significant.⁹ Specifically, I applied a linear regression model to estimate the relationship between Wave's stock price and the overall market, as well as the typical variation in Wave's stock price. I regressed Wave's stock returns on the returns of the Nasdaq Composite Index using a control period from July 31, 2002 through July 30, 2003. Results are presented in Exhibit 3. The model demonstrates that the change in Wave's stock price on August 15th was not statistically significant. Therefore, the decline from August 14th to August 15th is attributable to the normal variation in Wave's stock price and not to any information communicated by the Company during the August 14th conference call.¹⁰

16. Moreover, Plaintiffs fail to show that Wave's stock price became artificially inflated by misleading statements made after the August 14th conference call. Plaintiffs identify the filing of an S-3 registration statement on August 20, 2003 and the filing of a prospectus on August 22, 2003 as misleading the market. However, Wave's stock price fell on both days, declining from \$3.17 on August

⁸ See "Wave Systems Sets Holder Vote Following SEC Proxy Review," *Dow Jones News Service*, 8 August 2003.

⁹ As I noted above, the conference call was after the market closed on August 14, 2003.

¹⁰ The residual return on August 15, 2003 was -6%, with a t-statistic of -0.97.

19, 2003 to \$2.88 on August 25, 2003. Thus, these actions by the Company did not cause any inflation in the Wave's common stock.

17. Finally, the decline in Wave's stock price following the December 18, 2003 disclosure is consistent with market reactions to the announcement of SEC investigations, and can not be claimed by Plaintiffs to be caused by a corrective disclosure. Evidence from academic research indicates that the announcement of an SEC investigation has a negative effect on a company's stock price. For example, a recent paper indicates that stock prices of small capitalization firms such as Wave, decline by an average of 8% to 12% following the disclosure of an SEC investigation.¹¹ Thus, the decline in Wave's stock price at the end of the Class Period can be attributed to the announcement of the SEC investigation of Wave, supported by the fact that the limitations of the Intel and IBM relationships were known to the market months earlier.

IV. The identified class consists predominantly of short sellers and market makers.

18. Significant factors related to Wave's publicly issued common stock before and during the class period indicate a potential for conflicts among purchasers. Specifically, the large volume of activity associated with short selling, and the dramatic increase of market makers in this stock during the class period, indicate

¹¹ McDowell, John, "A Look at the Market's Reaction to the Announcements of SEC Investigations," The Leonard N. Stern School of Business, Glucksman Institute for Research in Securities Markets, April 1, 2005.

very different and potentially contradictory trading patterns among class members.¹²

19. In my review of the potential class certification issues in this matter, I examined the Equity Trade Journal (“ETJ”) data produced to Defendants’ counsel in response to Defendants’ subpoena to the NASD.¹³ The ETJ data report the trading activity in Wave’s common stock, and captures various characteristics of each trade executed on the Nasdaq National Market. The data reveal the date and time of a transaction, price, share volume, and the nature of the sale (buy, sell, short sale, exempt short sale, etc.) In addition, the data identify the market makers or brokers on both sides of the transactions, and indicate whether they were trading on their own behalf (principal transactions) or on the behalf of a customer (agent transactions or riskless principal transactions).¹⁴
20. Generally speaking, market makers and short sellers are not typical investors. Market makers provide liquidity to the market, and are required to trade whenever typical investors enter the market. In practice, market makers prefer to maintain a level inventory position, and hence usually buy and sell approximately the same

¹² For example, a market maker who purchases in the morning of a particular trading day and sells at the end of that trading day would need to point to a corrective disclosure occurring during the day, after his purchase but prior to his sale. His efforts to point to this type of interim corrective disclosure would run counter to the claims of other potential class members who might have sold prior to or purchased after the supposed corrective disclosure.

¹³ ETJ data for the period from July 1, 2003 to August 31, 2003 was received via a subpoena request to the NASD (National Association of Securities Dealers). For purposes of this analysis I referred to the reported transactions from July 16, 2003 to August 15, 2003.

¹⁴ My analysis of the ETJ data is based on academic research using similar data. For example, see Ellis, Michaely, and O’Hara, “The Accuracy of Trade Classification Rules: Evidence from Nasdaq,” *Journal of Financial and Quantitative Analysis*, December 2000. See also, Griffen, Harris, and Topaloglu, “The Dynamics of Institutional and Individual Trading,” *Journal of Finance*, December 2003. For my analysis, I analyzed the reported volume.

amount of shares each day.¹⁵ As a result, market makers generally cannot show any damages from alleged securities fraud.

21. Short sellers primarily believe that the stock price is overvalued and predict that the stock price will decline.¹⁶ These investors sell first, and then buy shares later. If the stock price has moved down as they believed, they may be able to purchase the shares they sold short at a lower price; or, if the stock has actually increased in price, they may be forced to purchase the necessary shares at a higher price. Needless to say, such investors cannot be said to be trading for similar reasons as typical investors.
22. Short sellers who are resetting their short positions by simultaneously buying and selling are not trading based on information regarding the stock's fundamental value. For example, a short seller may be forced to cover his short position if the lender of the shares wishes to have the shares back. Should the short seller desire to maintain his short position, he would simultaneously buy (to cover the short position), and sell (to reset the short position). Because traders implementing such strategies both buy and sell at alleged inflated prices, they would not suffer any damages resulting from alleged securities fraud.
23. Even assuming that a short seller could claim damages, such damages would need to be computed separately and according to a different (and potentially

¹⁵ See Ellis, Katrina, "Who trades IPOs? A close look at the first days of trading," *Journal of Financial Economics*, 2006, 340 – 341, 343. See also Amihud, Yakov and Haim Mendleson, "Delearship Market: Market-Making with Inventory," *Journal of Financial Economics*, 1980, 32, 47.

¹⁶ Short selling is a strategy whereby investors sell shares without owning the stock, in hopes of a decline in the stock price. To sell short, an investor must first "borrow" the shares he wishes to sell. The "lender" of the shares retains legal ownership of the shares, and can require the short seller to deliver the shares back at any time.

conflicting) methodology from other class members. As noted above, short sellers who sell short, buy, and sell short again during the class period with a view to maintaining their short positions will not incur any damages. It is only those few short sellers who sold short prior to the class period and bought during the class period (without selling short again) who may be able to claim damages.¹⁷

24. To determine the extent of short selling activity in Wave stock, I analyzed the transactions marked as short sales, in conjunction with the change in short interest from July 16 to August 15, 2003. Notably, there was a large volume of short selling activity over this month, but total short interest outstanding did not increase by very much. In particular, the data indicate at least 60 million shares were sold short, accounting for over 35% of Wave's shares sold on Nasdaq during this period (see Exhibit 4). However, total short interest increased by only two million shares, indicating that short sellers also purchased approximately 58 million shares. Thus, it is clear that many short sellers were resetting their short positions in Wave by simultaneously buying and selling.
25. Next, I analyzed the data to determine the amount of activity that can be attributed to market makers' proprietary trades in addition to trades conducted by short sellers. Proprietary market maker trades (those for a market makers' own accounts) are identified with a capacity of "P" for "principal transactions." I quantified the amount of shares bought and sold by market makers acting in a

¹⁷ These investors are not included in my estimation, discussed further in paragraphs 25 – 28, that approximately 60 – 80% of trading volume in Wave's common stock during the first two weeks of the class period is attributable to short sellers and market makers.

principal capacity and then identified all non-market maker short sales – the trades marked as short sales that were not proprietary market maker trades (capacity of “A” for agent or “R” for riskless principal). Finally, I estimated the amount of shares purchased by non-market maker short sellers based on the change in total short interest outstanding from July 16 to August 15, 2003.¹⁸

Based on my analysis, I estimate that at a minimum, trades associated with market makers and short sellers account for approximately 60% of reported volume during the first two weeks of the alleged class period (see Exhibit 5).¹⁹

26. However, in my opinion, the data as reported likely understates the true amount of short selling activity. A careful review of the data indicates that market makers appear to facilitate short selling by other investors without appropriately identifying the investor transaction as a short sale. For example, market makers often simultaneously buy and then sell shares short. Exhibit 6 provides examples of a few of these transactions. Since the buy often occurs before the sale, there appears to be no need for the market maker to short sell. Further, Knight Securities accounts for most of the short selling activity. Knight is considered a wholesaler because it primarily services other brokers. In my experience, it is unlikely that Knight would take positions in a stock and I would expect that they would not short sell on their own account without having a known counterparty.

¹⁸ I estimated how many shares short sellers would have needed to buy in order to explain the total increase in short interest outstanding over the month. Based on the total change in short interest, and each day's proportion of total reported volume over the month, I estimated daily changes in short interest. I then calculated the number of shares that short sellers must purchase on each day by subtracting the daily change in short interest from the number of shares sold short.

¹⁹ Market makers and short sellers comprise 57% of the reported buy volume and 59% of the reported sell volume.

- Therefore, a reasonable interpretation of the data is that the market maker purchased the shares from a short seller and then passed the short sale on to someone else.
27. As reported, the data suggest that only the market maker was shorting, when in reality it could have been both the market maker and the investor shorting. Note that in Exhibit 6 when Knight is buying, the corresponding Contra Short Sale field is blank indicating that this sale was not marked as an originating short sale from the counterparty's position. In my opinion, it is plausible that the majority of the market maker short sales originated with an investor short sale and that the investor short sales are misidentified in the data as "sales" not "short sales." To provide an upper bound for trading attributable to short sellers and market makers, I assume that all non-exempt²⁰ market maker short sales were in reality investor short sales. Doing so increases the percentage attributable to short sellers and market makers to over 80%.
28. Based on the analysis above, market makers and short selling trading activity accounted for approximately 60% to 80% of total trading volume in Wave stock during the first two weeks of the class period. Thus, other investors, those not acting as market makers or involved in short selling trading activity, accounted for only 20% to 40% of total reported volume. Given this disparity and the widely diverse investment motivations among potential class members, it is likely

²⁰ While typical investors face restrictions on when they can sell a stock short (i.e., uptick rule), market makers can sell short at any time as long as they classify the trade an exempt short sale. This classification is captured in the ETJ data. Thus, it is reasonable to conclude that all exempt short sales should be classified as market maker short sales and do not necessarily imply that the market maker was simply passing on the short sale from an investor.

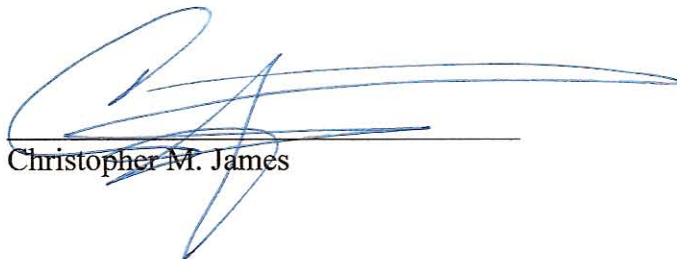
that conflicts will arise among these different types of investors in Wave's stock. Furthermore, any market makers and short sellers who both bought and sold during the class period would not have been affected by any alleged securities fraud and will not be able to claim damages because of Wave's actions.

V. Conclusion

29. Plaintiffs allege that Wave's stock price was inflated because the Company issued false and misleading information regarding its relationships with Intel and IBM in July and August 2003. In their Amended Complaint, Plaintiffs identify the December 18, 2003 announcement of a formal investigation by the SEC as the only corrective disclosure. However, it is clear from my review of the announcements by Wave that market participants were aware of the relevant information in this matter well before December 18, 2003. Thus, the identified class period includes investors who purchased after corrective disclosures.
30. Furthermore, during the first two weeks of the class period, market makers and short sellers comprised the majority of trading volume in Wave stock. For the reasons stated above, these investors will either not be able to claim damages or will be required to prove damages in a different and potentially conflicting way to other class members. Investors not involved in market making or short selling activities accounted for only 20% to 40% of total trading volume in Wave stock during the first two weeks of the class period. Therefore, it is likely that any attempt to demonstrate losses in this case will result in conflicts among class members.

31. I reserve the right to amend, revise and/or modify these opinions based on changes, clarifications, and additions to any reports and documents I have reviewed and based on any new information provided to me, or that may become available in the future.

June 5, 2006

A handwritten signature in blue ink, consisting of a large, stylized 'C' followed by a series of horizontal and diagonal strokes.

Christopher M. James